Where are the cures?

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It seems like the stem cell news cycle alternates between stories of incremental hope (take the heart disease model for drug discovery out of Stanford today) and stories decrying the woeful lack of cures out of CIRM. I think the popular imagination went from the word "cure" when Proposition 71 passed in 2004 to an immediate need to see those cures by 2005. Or at least by 2011.

The very first stem cell-based "cure" came in 1968, when doctors at the University of Minnesota transplanted bone marrow from one person into a child with a genetic blood disease. Bone marrow contains the blood-forming stem cells that continuously rebuild the blood and immune system. Today, bone marrow or blood-forming stem cell transplants save lives daily, and are an active area of research by CIRM grantees working to develop new cures for HIV/AIDS, sickle cell anemia and other diseases.

Bone marrow and the related cord blood stem cells are the only stem cells that currently deserve the label "cure."

You can think of science like a giant hose with discoveries at the tap and cures coming out the nozzle. It's a leaky hose, though, and ideas that look promising early on - and receive a great deal of press attention at the time - often leak out as they are disproven or shown to be ineffective. At CIRM, we fund the discovery end of the hose, constantly trying to generate good ideas that will one day make it out the other side. We fund the middle phases, where scientists figure out the best way of turning those early discoveries into cures (Here's a video with Hans Keirstead explaining why that process takes so much time). And we fund the end everyone watches so closely - where the cures come out.

Bone marrow stem cells went in the discovery end of that hose decades ago, starting with research in the 1950s, and new therapies are still pouring out, including the recent Berlin patient who was effectively cured of HIV infection.

Various types of adult stem cell discoveries went into that hose starting in the 1990s as new tissue-specific stem cells such as those in the brain, fat, placenta and skin were discovered. Clinical trials involving those cells are still underway, which means that despite exciting news stories of mid-hose success the cells have yet to make it out the cures end of the nozzle. Many trials look promising, but until the cells are shown to be safe and effective in large controlled trials, they aren't yet cures. CIRM funds a lot of adult stem cell research (here's a list of those awards, many of which involve complex manipulations rather than the simple cell transplants of earlier work) and we're excited about seeing some of the early discoveries start making it through clinical trials.

So, where are the embryonic stem cell cures? Well, they went into the discovery end of the hose in 1998 and we already have three clinical trials underway based on those cells. CIRM began funding stem cell research eight years later in 2006 and some of our grantees expect to be in clinical trials in the next few years. It's true that they have yet to come gushing out the cures end of the nozzle, but it's exciting to know that because of CIRM discoveries are at least in the the hose, making their way toward the end we're all watching so eagerly.

- A.A.

Tags: Keirstead